

E-cigarette a path away from tobacco or towards it, Riyadh, KSA

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ABSTRACT

Background: cigarette smoking is one of risk factors for early mortality due to cancer, cardiovascular disease, and (COPD) chronic obstructive pulmonary disease. The study aims to determine whether e-cigarette helps in tobacco cessation. **Methodology:** our study is a cross-sectional study in KSA Riyadh includes both Saudi and non-Saudi adult smokers conducted among university students, sample size was 150 persons using systemic random sample, data analyzed using SPSS and P value of 0.5 or less considered significant. **Results:** the major reason for starting to use e-cigarettes were because of good flavor 41%, the majority 32% agreed that e-cigarette is efficient and helps in tobacco cessation, in terms of the E-cigarette in nicotine reduction (53.3%) of the participants said yes and (46.7%) said no, 51% of participants returned to conventional cigarettes. **Conclusion:** the majority of the participants perceive that the e-cigarette is an efficient alternative for conventional cigarette and can help to reduce regular smoking and quitting. The majority of the respondents use the conventional cigarettes.

Keywords: E- cigarettes, Tobacco, Tobacco cessation, conventional cigarettes.

1. BACKGROUND

Cigarette smoking is one of risk factors for early mortality due to cancer, cardiovascular disease, and COPD. Cigarette smoking also seems to be a main risk factor for pulmonary and other systemic infections (Arcavi and Benowitz, 2004). Electronic cigarettes (e-cigarettes) are battery-operated tool that do not use tobacco leaves but instead vaporize a solution the user then inhales. Since they were invented in 2003, e-cigarettes have captured considerable attention with huge controversy. Vapor that the user inhales is generated by heating a liquid to produce an aerosol. Vaping is when smoker use e-cigarette. E-



cigarettes contain a liquid which usually contain nicotine, flavorings, glycerin, and propylene glycol, some of these liquids, not containing nicotine (Wang et al., 2016; Aldhmadi et al. 2021). The prevalence of current smoking in Saudi Arabia is 17.5%. Among school students, the prevalence of current smoking is 16.5%, among university students 13.5%, and among adults 22.6%. In elderly people, the prevalence of current smoking is 25%. The prevalence of smoking in males 26.5%, while in females it 9% (Bassiony, 2009). 4.9% from 4444 students in North Carolina did not use e-cigarettes and 12% of e-cigarette users had never use a regular cigarette (Sutfin et al., 2013). However, the propagation of current smoking in Saudi Arabia is 17.5%. Among school students, the propagation of current smoking is 16.5%, among university students 13.5%, and among adults 22.6%. 25% of elderly people are currently smoking. The prevalence of smoking in males is 26.5%, while in females it is 9% (Bassiony, 2009). Smokers who noticed the warnings were significantly more likely to endorse health risks, including lung cancer and heart disease (Borland et al., 2009). Person who smokes cigarettes is at higher risk of cardiopulmonary and wound-related complications after operation than nonsmoker (Møller et al., 2002). Studies have exhibited that smoking and genetic risk factors interact to cause increase risk of rheumatoid arthritis (Källberg et al., 2011). Addition of that Vapors from EC contain toxic and carbonyl compounds which can cause cancer (Kosmider et al., 2014).

2. METHODOLOGY

This is a cross-sectional study, conducted in Riyadh, Saudi Arabia capital city, with population around 6,859,000. The study duration was 6 months from 2019-1 till 2019-6. The study included university students from King Saud University, Alfaisal University and Al Maarefa University with exclusion of non-smoker and female. The sample size was 150 participants who were chosen through systemic random sample. A pre-coded pre-tested questionnaire contains background questions (gender, academic year, and university) in addition to other close ended question that aims to investigate regarding whether e-cigarette helps in tobacco cessation. The questionnaire was be subjected to probe for reliability and validity testing.

Collection method

Interviewer administered, we used questionnaire method and were distributed to adult Saudi and non-Saudi smokers and ex-smokers. Data were analyzed using SPSS (V 23) and Microsoft Excel to generate tables and charts. P value of 0.5 was considered significant. Consent was optioned from participants before data collection. Emphasizing on confidentiality and the participants has rights to leave the study at any time.

3. RESULTS

Table 1 showed that most participants were from King Saud (60%) and the second most were Alfaisal University (33.3%) and the least participants were from Almaarefa University (26.7%). According to preparatory year it was in this order (From high to low) (20%) from first year, (19.3%) from second year, (17.3%) from third year, (16.7%) from fourth year, (8.7%) from fifth year and finally (5.3 %) from sixth year.

Table 1 personal data

University	King saud university = 60 (40%)		Alfaisal university = 50(33.3%)		Almaarefa university = 40(26.7%)			150
Academic Year	Preparatory year =19(12.7%)	First year =30 (20%)	Second year =29 (19.3%)	Third year =26(17.3%)	Fourth Year = 25 (16.7%)	Fifth Year = 13 (8.7%)	Sixth Year = 8 (5.3%)	150

n=150

Figure 1 showed that (40.7%) are at the age of 20-21 while the second highest percentages were (23.3%) at the age of 22-23 the third were (20%) from age 18-19 and the least participants were (16%) who were over 23 years old. Table 2 indicated that (41%) of our respondents chosen the good flavor as a reason to use E-cigarette, where (32.3%) picked the good smell and (26.7%) selected others. In terms of the E-cigarette in nicotine reduction (53.3%) of the participants said yes and (46.7%) said no.

Table 2 Reasons of starting with e-cigarette instead of conventional cigarette

Reasons using E-cigarette	Good smell = 34 (32.3%)	Good flavor = 43(41%)	Other= 28 (26.7%)	105
E-cigarette in nicotine reduction	Yes = 80 (53.3%)		No = 70 (46.7%)	150

n=150

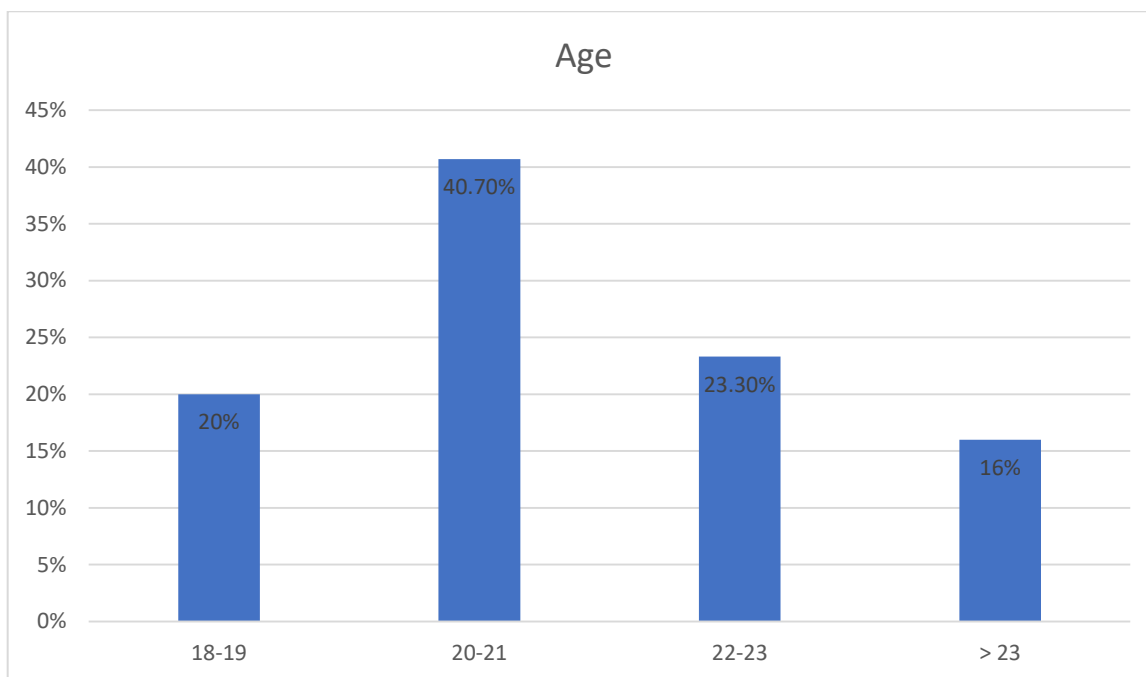


Figure 1 Age distribution

Table 3 showed that the participants' responses regarding the efficacy of e-cigarette as an alternative for conventional cigarette revealed that the majority (32%) agreed that e-cigarette is efficient and helps in tobacco cessation, and (21.3%) has strongly agreed, while (25.3%) of the participant disagreed, and (21.3%) has strongly disagreed. Table 4 showed that (51%) of participants' returned to conventional cigarette and (54%) have craving tobacco after switching to E-cigarette. The reasons of getting back to tobacco smoking are cost (24.2%), less nicotine (13.7%), and peer effect (13.7%) while the majority of them (48.4%) have other reasons.

Table 3 E-cigarette as an efficient alternative for conventional cigarette smoking

E-cigarette in tobacco cessation	Strongly agree =32 (21.3%)	Agree =48(32%)	Disagree =38 (25.3%)	Strongly disagree =32 (21.3%)	Total 150
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n=150

Table 4 reasons of e-cigarette smokers getting back to conventional cigarette

Returning to regular cigarette	Yes = 57(51%)		No =55(49%)		112
Craving tobacco after switching to E-cigarette	Yes =51(46%)		No =60(54%)		111
Reasons to get back to Tobacco smoking	Cost = 16 (24.2%)	Less nicotine =9 (13.7%)	Peer effect =9 (13.7%)	Other = 32 (48.4%)	66

n=150

Table 5 indicated that (43.33%) of KSU’s smokers use the Conventional cigarette, while (40%) are using E-cigarette, and (16.67%) were Ex-smokers. In Alfaisal University we found that (42%) of smokers using the Conventional cigarette, while (34%) are using E-cigarette and (24%) were Ex-smokers. In almaarefa we found that (47.50%) of smokers use the Conventional cigarette, while (20%) are using E-cigarette, and (32.50%) were Ex-smokers. In total we found that (44%) of smokers use the Conventional cigarette, while (32.67%) are using E-cigarette, and (23.33%) were Ex-smokers. There is no statistical significant relation between different universities with proportion of E-cigarette and conventional cigarette smoking.

Table 5 Comparison between different universities with proportion of E-cigarette and conventional cigarette smoking

University	Conventional Cigarette smokers	Electronic Cigarette smokers	Ex-smoker	Total (% and no)
King saud	=26 (43.33%)	=24 (40%)	=10 (16.67%)	60
Alfaisal	=21 (42%)	=17 (34%)	=12 (24%)	50
Almaarefa	=19 (47.50%)	=8 (20%)	13 (32.50%)	40
Total	=66 (44%)	=49 (32.67%)	35 (23.33%)	150

P value: 0.220

4. DISCUSSION

Our study indicates good flavor is the leading criteria for e-cigarettes use. This goes in line with a study by Kong 2015 (Kong et al., 2015). This implies researchers should measures attitude and practice towards E-cigarettes. Our study shows the majority of the participants perceive that e-cigarette is an efficient alternative for conventional cigarette which goes in line with a study of using e-cigarette to aid smoking cessation compared with nicotine replacement therapy done by Brown et al., (2014), which showed that e-cigarette is the efficient alternative and more likely to report abstinence than either (NRT) or no aid. This implies researches should explore the psychological and physiological dependence potentialities of e-cigarette.

Our study showed that the majority of the participants returned to conventional cigarette which goes in contrary to the result of brown’s article of real-world effectiveness of e-cigarette when used to aid smoking cessation (Brown et al., 2014) which showed the majority of the participants didn’t return to conventional smoke. The contradiction between both results is due to the differences between the time frame and his research did not cover the reasons getting back to conventional cigarette. Based on these results we recommend ministry of health and researchers to highlight on other reasons to getting back to conventional cigarette.

There is no relationship between academic year and the proportion of the e-cigarette s and conventional cigarette users. Our study shows that around three quarters of all students uses conventional cigarette, which goes in contrary to the result of Sutfin’s article on Electronic cigarette use by college students (Sutfin et al., 2013) which shows that the majority of college students on his study are e-cigarettes users. The contradiction between both studies is due to the gender popularity which is more females on Sutfin's article. We recommend the researchers to focus on this subject and to do more investigations regarding the reasons behind spread of e-cigarette and conventional cigarette among college students.

5. CONCLUSION

The majority of the participants perceive that the e-cigarette is an efficient alternative for conventional cigarette and can help to reduce regular smoking and quitting. The majority of the respondents use the conventional cigarettes.

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Author’s contribution

Amar Fathi M Khalifah, Abdullah sulaimanBinHamad, Mansour Fahad Almusayab, participated in the development of study conception and design, Ammar Abdu Alkhatabi, Sultan AbdulazizAlsaif, Mohammed Ayoub Aljayan, Mohammed hassanAlsomali, Mustafa Akram Hashem, Saad Abdullah Alsaif, Osama Abdu Alkhatabi, Talal Abdullatif Faden, Abdulrahman Abdulaziz Al Moaqal, Ahmed Nihad Sabooni, participated in data collection and analysis and manuscript drafting.

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Conflict of interest

The authors declare that there are no conflicts of interests.

Ethical approval

The study was approved by the IRB of AlMaarefa University, Riyadh, Saudi Arabia, (Ethical approval code (3/203)).

Data and materials availability

All data associated with this study are present in the paper.

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